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## SUBSTITUTE SPECIFICATION

## [0001] PLUMBING OUTLET FITTING

[0002] The present invention relates to a sanitary outflow armature having a liquid guide that opens into a fitting outlet, in the area of which a plumbing functional unit in the form of an insertion cartridge is provided, wherein the clear cross-section of the opening of the liquid guide being adapted to the insertion cartridge at least in the opening area of the fitting outlet, and the insertion cartridge being capable of being inserted into the fitting outlet from the opening side and being held removably therein.

## [0003] BACKGROUND

[0004] Various jet regulators have been created that are provided as plumbing functional units in the area of the fitting outlet of a sanitary outflow armature, and that are used to produce a soft, non-spraying jet of water. The known jet regulators can regularly be inserted into a sleeve-shaped outlet nozzle that can be screwed onto the end of the fitting outlet.

[0005] However, the use of a sleeve-shaped outlet nozzle that is to be screwed onto the fitting outlet requires an expensive machining of the outlet fitting, and, in addition, limits the structural clearance in the design of such an outlet fitting. In addition, the outlet nozzle, manufactured as a separate metal collar, usually chromed, results in significant additional costs.

[0006] In particular in high-quality fittings, which must also satisfy high aesthetic demands, the fitting and the associated nozzle must be jointly ground, polished, and subsequently chromed or painted together, at high expense, in order to achieve the smoothest possible transition between the fitting and the nozzle without color deviations and without disturbing gaps, and in order to ensure that the diameter is identical. The gaps that are standard with the use of conventional nozzles between the fitting and the nozzle that screws onto the outlet end of the

fitting can not only disturb the optical appearance of such a fitting, but can also form a flaw from a hygienic point of view due to the collection of dirt.

[0007] SUMMARY

[0008] From CH-A-380 042, a plumbing outlet fitting of the type named above is known in whose opening area a jet regulator in the form of an insert cartridge is provided. The clear opening of the opening area of the plumbing outlet fitting is adapted to the insertion cartridge in such a way that this cartridge can be inserted from the opening side into the fitting outlet in removable fashion. The peripheral wall at the opening side of the insertion cartridge has a hexagonal outer shape onto which a socket wrench can be placed for grasping and screwing on. The jet regulator, in the form of an insertion cartridge, can be inserted into the fitting outlet up to an insertion stop, and an axial annular seal is provided between the insertion stop and the adjacent end surface of the insertion cartridge.

[0009] The outlet fitting known from CH-A-380 042 does indeed make it possible to do away with an additional chromed metal collar and the expense connected therewith. However, in order to create the insertion stop required for the axial seal in the interior of the tube of the plumbing outlet fitting, a comparatively thick tube is required that has to be milled out in the opening area, or the later addition of a corresponding annular flange, and thus also an additional significant manufacturing expense, is required.

[0010] Therefore, the object arises in particular of creating a sanitary outflow armature that can be used with a jet regulator or with another plumbing functional unit without essential limitation of the structural clearance, and which is nonetheless distinguished by a comparatively low manufacturing cost.

[0011] In a plumbing outlet fitting of the type named above, the solution according to the present invention of this problem is in particular that the insertion cartridge is sealed radially in peripheral fashion against an intermediate holder or against the inner peripheral wall of the fitting outlet, and/or that the intermediate holder is sealed radially in peripheral fashion against the inner peripheral wall of the outlet fitting.

[0012] The functional unit, in the form of an insertion cartridge, can be inserted into the fitting outlet from the opening side and is held therein in removable fashion. For the acceptance of this insertion cartridge, the inner diameter of the liquid guide of the outlet fitting is adapted to the insertion cartridge at least in the area of the opening of the fitting outlet. Thus, an outlet nozzle, and its additional significant costs, can be omitted; up to now, such nozzles have been associated with an overly high portion of the overall costs of an outlet fitting. Because the screwing on of such an outlet nozzle can be omitted, and because such an outlet nozzle also does not have to be processed together with the outlet fitting for color matching, the manufacture of the sanitary outflow armature is simplified significantly. The expense connected with the manufacture of the outlet fitting according to the present invention is however also significantly reduced in that the insertion cartridge is sealed radially in peripheral fashion against the intermediate holder or against the inner peripheral wall of the outlet fitting, and/or that the intermediate holder is sealed radially in peripheral fashion against the inner peripheral wall of the fitting outlet. Due to this radial seal, an insertion stop or similar sealing flange required in the case of an axial seal can be omitted, which otherwise would have to be created, at a considerable manufacturing expense, by milling out a correspondingly thick tube piece or by the later insertion of an annular flange, and made in the opening area of the outlet fitting. Because a nozzle can be omitted, the gap that is typically present between the nozzle and the outlet fitting when conventional nozzles are used, and that has a disturbing optical effect and conflicts with desirable hygienic goals, can be avoided. The plumbing functional unit is held removably in the fitting outlet of the sanitary outflow armature, and can thus easily be detached and removed even by unskilled users for service work, such as for example the removal of dirt or for decalcification. The omission of an outlet nozzle also increases the structural clearance in the design of an outlet fitting, so that for example it is also possible to use colored outlet fittings without

having to manufacture special nozzles having the corresponding color, at additional cost.

[0013] It is useful if the insertion cartridge is situated in the fitting outlet with at least the predominant part of its longitudinal extension, preferably with its complete longitudinal extension. If the insertion cartridge is situated in the fitting outlet with its entire longitudinal extension, it can be housed in the fitting outlet so as to be hidden, i.e., practically invisible from the outside, and secure against manipulation. From there, the insertion cartridge can be detached for example with the aid of a crown key or an open wrench, or some other removal tool.

[0014] The insertion cartridge can be held immediately in the fitting outlet without additional adapters. Another specific embodiment according to the present invention provides that the insertion cartridge is held in the fitting outlet by means of a preferably sleeve-shaped intermediate holder.

[0015] Here it is possible for the intermediate holder, which can be inserted into the fitting outlet from the opening side, to be held in the fitting outlet in removable or in non-removable fashion.

[0016] It is advantageous if the intermediate holder is held in the fitting outlet by means of a glued connection, a clamp connection, a locking connection, and/or a screw connection, and/or through pressing, clutching, or wedging.

[0017] Here it is advantageous if the intermediate holder is sealed against the inner peripheral wall of the fitting outlet, preferably around the complete periphery. The sealing of the intermediate holder in the outlet fitting can take place by means of additional seals, such as for example an O-ring or a flat seal, seals formed onto the intermediate holder, or with the aid of connecting means, for example the adhesive means used in the gluing of the intermediate holder.

[0018] It is advantageous if the insertion cartridge is held in the fitting outlet or in the intermediate holder by means of a clamp connection, a locking connection, or a screw connection. Thus, the insertion cartridge can for example be held in the outlet fitting or the intermediate holder by a one-threaded or multi-threaded screw

connection, or by snap connections; removable connections of this sort enable a rapid and simple assembly and disassembly of the functional unit as needed.

[0019] A preferred specific embodiment according to the present invention provides that at least one annular seal, preferably at least one O-ring, is provided for the sealing between the insertion cartridge and/or the intermediate holder on the one hand and the outlet fitting on the other hand.

[0020] According to a further development of the present invention, it is provided that the insertion cartridge or the intermediate holder bears an outer thread that can be screwed into an inner threading in the fitting outlet, and that the outer thread and the inner thread are dimensioned and situated such that when the insertion cartridge and/or the intermediate holder are screwed onto one another, the threads grasp one another in a relative position of the outlet fitting on the one hand and the insertion cartridge and/or intermediate holder on the other hand in which the O-ring, or similar annular seal, provided on the outer periphery of the insertion cartridge or of the intermediate holder does not yet make frictional contact with the outlet fitting. Through the situation of the annular seal, which seals the insertion cartridge radially in the fitting housing, during assembly and disassembly a clear advantage can be made use of: during assembly, there is a significantly greater feeling for finding the threads, because the annular seal is not pressed radially until the thread has already been found. The pressing of the annular seal produces a large amount of friction, which would otherwise make the feeling for the assembly significantly more difficult. During disassembly, the selected situation of the annular seal has the advantage that the insertion cartridge is rotated out of the screwed connection with the fitting outlet with the aid of the insertion and removal tool. As long as the annular seal is still in the pressed state, there is a forced axial movement through the threading. The threading does not come out of engagement until the annular seal has left the fitting seat in the axial direction. This has the decisive advantage that the functional unit, constructed as a hidden insertion

cartridge and assembled with an intermediate holder if necessary, can be removed from the fitting completely by rotational movement, without requiring either additional axial drawing due to the influence of friction or the support of water pressure.

[0021] However, it is also possible for at least one peripheral seal to be formed in one piece onto the insertion cartridge; here, in the sealing region the insertion cartridge can be constructed not only as a multi-component injection-molded part, but in particular also as a single-component injection-molded part.

[0022] A particularly advantageous development according to the present invention, warranting separate protection, therefore provides that the insertion cartridge and/or the intermediate holder are connected in one piece with at least one peripheral seal between the insertion cartridge and/or the intermediate holder on the one hand and the outlet fitting on the other hand. The one-piece formed-on seal, provided on the insertion cartridge and/or on the intermediate holder, prevents creeping or leakage currents of the liquid, etc., flowing through the outlet fitting between the insertion cartridge and/or the intermediate holder on the one hand and the outlet fitting on the other hand.

[0023] It is possible for the component of the insertion cartridge and/or of the intermediate holder having the seal to be manufactured as a multi-component injection-molded part, and for this component to be made of a flexible and/or elastic material in the area of the at least one seal. For the simple recycling of the material that forms the insertion cartridge and/or the intermediate holder, it is however useful if the seal and the component, connected with it in one piece, of the insertion cartridge and/or of the intermediate holder are manufactured from the same, preferably food-safe, material. This can simplify the manufacturing outlay, and the tool costs for an injection-molding tool that may be required can be kept comparatively low.

[0024] A preferred development according to the present invention provides that the plumbing functional unit is fashioned as a jet regulator.

[0025] Additional features of the present invention result from the following description of exemplary embodiments according to the present invention, in connection with the claims and the drawings. The individual features can be realized individually or in combination in a specific embodiment according to the present invention.

[0026] BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Shown are:

[0028] Figure 1 shows a plumbing outlet fitting in whose fitting outlet a plumbing functional unit formed as an insertion cartridge can be inserted in removable fashion by means of an intermediate holder,

[0029] Figure 2 shows a plumbing outlet fitting in which the plumbing functional unit in the form of an insertion cartridge can be removably inserted into the fitting outlet without an intermediate holder, and

[0030] Figure 3 shows a plumbing outlet fitting having an insertion cartridge that can be inserted into the fitting outlet, in which an additional, identically constructed insertion cartridge, provided for exchange, can be used to screw the insertion cartridge in and out of the fitting outlet.

[0031] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 shows a plumbing outlet fitting 2 in the area of the fitting outlet 4 of its liquid guide 3. In the area of the fitting outlet 4, a plumbing functional unit in the form of an insertion cartridge 5 is provided that is held in fitting outlet 4 via a sleeve-shaped intermediate holder 6. The insertion cartridge 5 can be inserted into the intermediate holder 6 from the opening side of the intermediate holder 6 up to a holding projection 7. The intermediate holder 6 has on its outflow-side peripheral edge area an outer thread 8 that can be screwed into a complementary inner thread in the fitting outlet 4 in such a way that the intermediate holder 6 and the insertion cartridge 5 situated therein are situated completely in the fitting outlet 4 with their entire longitudinal extension.

[0032] At the side facing away from the direction of flow of the outer threading 8, on the periphery of the intermediate holder, an annular seal 11, held in an annular groove 10, is provided that provides a seal in the radial direction between the intermediate holder 6 and the inner periphery of outlet fitting 1. Here, the insertion cartridge 5 is formed from a jet regulator 12 at the flow outlet side, that is connected, preferably in removable fashion, at the flow inlet side with a flow regulator 13 as well as with a sieve attachment 14 that is connected upstream.

[0033] At the flow inlet side of the intermediate holder 6, an additional sieve attachment 15 is provided that can extend over a comparatively large cross-section inside liquid guide 3 of the outlet fitting 2. The sieve attachment 15 is connected in removable fashion with the intermediate holder 6, and has for this purpose a peripheral locking projection 16 on its peripheral edge that engages in an annular groove on the inner periphery at the flow inlet side of the intermediate holder 6. Between the sieve attachment 15 and an end surface at the flow inlet side of the jet regulator 12 of the insertion cartridge 5, an annular seal 17 that seals in the axial direction is provided; the jet regulator 12 is held between a holding projection 7 and the sieve attachment 15 with an annular flange 18. Functional units of standard construction, such as for example a jet regulator, flow regulator, backflow prevention device, and/or sieve attachment, can be inserted into the intermediate holder 6.

[0034] Figure 2 shows a sanitary outflow armature 1 into whose outlet end a plumbing functional unit, in the form of an insertion cartridge 5, can also be inserted without an intermediate holder. For this purpose, the insertion cartridge 5 has a multi-part cartridge housing 19, here constructed in two parts, having an outer threading 21 on a housing part 20 at the flow outlet side. The insertion cartridge 5 can be screwed with this outer threading 21 onto an inner threading that is situated on the inner periphery of the liquid guide 3 provided at the outflow end of the outlet fitting 1. An annular seal 11 is also provided on the housing part 20, on the side of outer threading 21 facing away in the direction of flow; this



annular seal is situated in an annular groove on the outer periphery of the cartridge housing 19.

[0035] The insertion cartridge 5 in Figure 2 is also situated with its entire longitudinal extension essentially completely in the fitting outlet 4. The insertion cartridge 5 also has an outflow-side jet regulator 12 having a jet fractionator 22 and a subsequent jet regulating device 23. The jet regulator 12 is connected at the flow outlet side with a flow regulator 13, and a sieve attachment 14 is connected upstream from flow regulator 13.

[0036] Due to the multi-part construction of the cartridge housing 19, the insertion cartridge 5 in Figure 4 has a modular construction. While the housing part 20 enables the installation of the insertion cartridge in an outlet fitting 1 even without the intermediate holder 6 and without a nozzle, alternatively an additional housing part (not shown here) at the flow outlet side, not having an external threading, can be provided that is used to install the insertion cartridge 5 for example in a standard nozzle.

[0037] While the left halves of the longitudinal sections shown in Figures 1 and 2 show the installation of the insertion cartridges in an outlet fitting constructed as a molded part, in the right halves of Figures 1 and 2 it is shown that these insertion cartridges can also be installed into an outlet fitting constructed at the opening side as a metal tube.

[0038] In Figures 1 and 2, it is indicated that the intermediate holder 6 in Figure 1 and the insertion cartridge 5 in Figure 2 have an end surface at the flow outlet side that is contoured and is formed from projections and recesses 24, this contouring being constructed as a tool engagement surface, for example for a complementarily shaped insertion tool. A standard coin piece can possibly also be used here as an insertion tool.

[0039] In contrast, in Figure 3 an outlet fitting 1 comparable to that shown in Figure 2 is shown to which the insertion cartridges 5 are allocated, of which one insertion cartridge 5 is situated in the outlet fitting 1, while an identically constructed different insertion cartridge 5' is provided for exchange. From Figure 3,

it can be seen that the end surface at the outflow side of each insertion cartridge 5, 5' has a contouring formed from projections and recesses 24 on the final edge, in such a way that the recesses 24 of the insertion cartridge 5 held in outlet fitting 1 act as a tool engagement surface for the projections 25 of the other insertion cartridge 5', which can be used here as an insertion tool, and vice versa. The projections 25 and recesses 24 on the outflow end side of the insertion cartridges 5, 5' form in each case a crown-type lower edge whose claws fit into the mating piece that is to be assembled or disassembled.

[0040] While in Figure 3 a complete insertion cartridge 5' is used to exchange the insertion cartridge 5 situated in the outlet fitting 1, it is also possible to use only an additional intermediate holder 6, or only an additional cartridge housing of an insertion cartridge that is otherwise not provided, to unscrew the insertion cartridge 5 situated in the outlet fitting or to unscrew the intermediate holder 6. For this purpose, the manufacturer of the fittings may supply only an additional intermediate holder or only an additional cartridge housing with the fitting, intended for use as an insertion tool. This has the advantage that the fitting manufacturer need not supply a second functional unit that can be installed in the outlet fitting, and the additional intermediate holder or the additional cartridge housing, manufactured and used in relatively large piece numbers, represents a very economical auxiliary tool.

[0041] The plumbing functional units shown here can be inserted into the outlet end of a sanitary outflow armature 1, 2 in such a way that a nozzle that can be screwed onto the outlet end from the outside can be omitted. Because in the outlet fittings shown here a nozzle can be omitted, the gap is also omitted that would otherwise remain between the nozzle and the outlet fitting; this gap would have an adverse effect on the optical appearance of such an outlet fitting and would work against hygienic requirements due to the accumulation of dirt. Because, in the outlet fittings 1, 2 shown here, the insertion cartridge is situated with its entire longitudinal extension completely in the liquid guide of the outlet fitting, the outlet fitting can be given a uniform coloring or chroming without a great expense,

without simultaneously also having to give a nozzle or other components the same color or shape. Because the entire inner diameter of the liquid guide provided in the outlet fitting is available for the insertion cartridge, large-surface sieve attachments can also be used, which significantly prolong the useful time between two maintenance intervals. If the insertion cartridge, as shown in Figure 5, is constructed at its flow outlet side in such a way that an insertion cartridge having an identical construction but intended for exchange can be screwed on and off it, the insertion cartridge can simultaneously also act as a tool for assembly and disassembly.